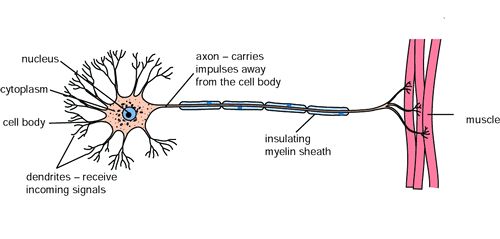
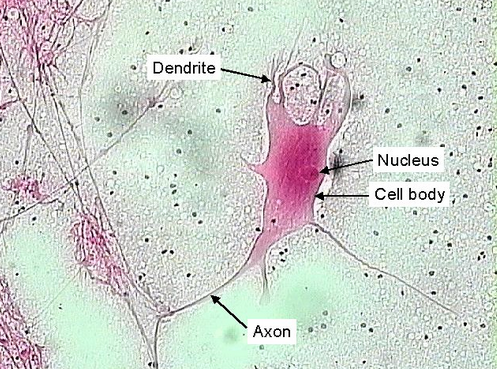
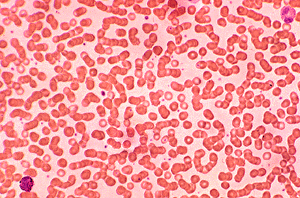
**Station #1: Nerve Tissue (contains nerve cells)**

Nerve cells are used to send electrical signals from one part of the body to another. Nerve cells located in the extremities (arms and legs) send sensory signals to nerve cells in the spinal cord and brain. Nerve cells in the spinal cord and brain can also send signals to motor neurons located in the arms and legs, which stimulate muscles to contract (producing movement). Nerve cells have special structures that allow them to receive signals. These structures are finger-like projections from the cell membrane and are called dendrites. Nerve cells also have long tubes (axons) through which they send signals.

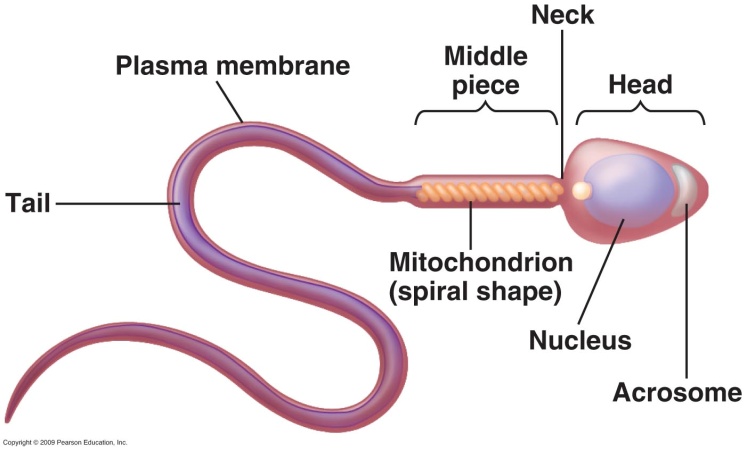
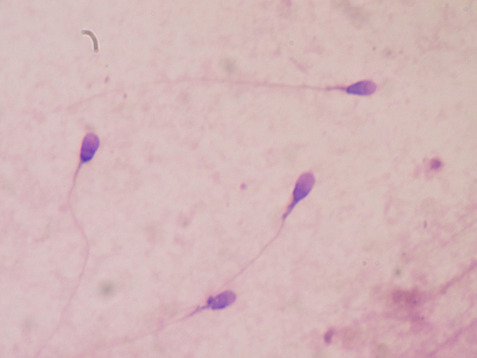
**Station #2: Blood Smear (contains red blood cells)**

Known for their bright red color, red cells are the most abundant cell in the blood, accounting for about 40-45 percent of its volume. The shape of a red blood cell is a biconcave disk with a flattened center – in other words, both faces of the disc have shallow bowl-like indentations (a red blood cell looks like a donut). Unlike many other cells, red blood cells have no nucleus and can easily change shape, helping them fit through the various blood vessels in your body. Red cells contain a special protein called hemoglobin, which helps carry oxygen from the lungs to the rest of the body and then returns carbon dioxide from the body to the lungs so it can be exhaled. Hemoglobin molecules can be found in the bowl-like indentations on either side of the cell.

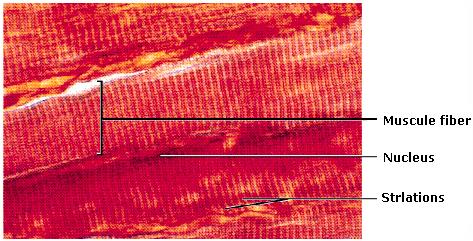
**Station #3: Sperm Cell**

Sperm cells are the male reproductive cell produced in the testes. They carry half of the DNA needed to make a baby. Once a sperm meets up with an egg cell (which carries the other half of the DNA), a fetus can begin to develop. Sperm cells are the smallest cells in the human body. They have a long flagellum for swimming up the female reproductive tract. They also have many mitochondria to provide energy for this long swim. Sperm also have a head region, which contains DNA and enzymes for penetrating the jelly-like coating surrounding the egg.

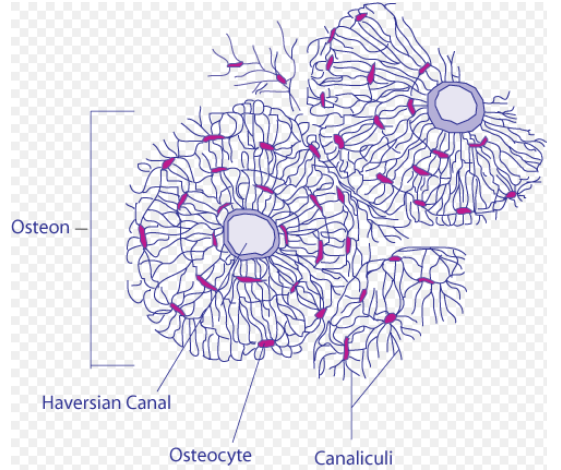
**Station #4: Muscle Tissue (contains muscle cells)**

Muscle tissue contains single muscle cells bundled together in larger fibers. Muscle fibers appear to be a bundle of strings underneath the microscope, and each string represents a single muscle cell. In skeletal muscle (i.e. muscles that can be voluntarily controlled), there are “striations” or stripes that run perpendicular to the muscle fibers. These striations are the parts of the muscle fiber where contraction (shortening) of the muscle occurs to produce movement.



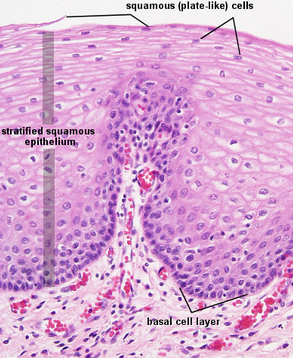
**Station #5: Bone Tissue (contains bone cells)**

Bone tissue contains several types of cells including osteoblasts and osteocytes. Osteoblasts are used to produce new bone cells and deposit collagen (a tough protein) and calcium (the hard material we know of as bone) around themselves. Once they are surrounded by the calcium they have created, osteoblasts are called osteocytes and help maintain the structure of the bone. Osteocytes and the layers of calcium that surround them form the series of circular layers that are seen in bone tissue under the microscope.



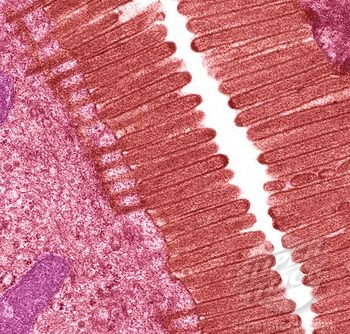
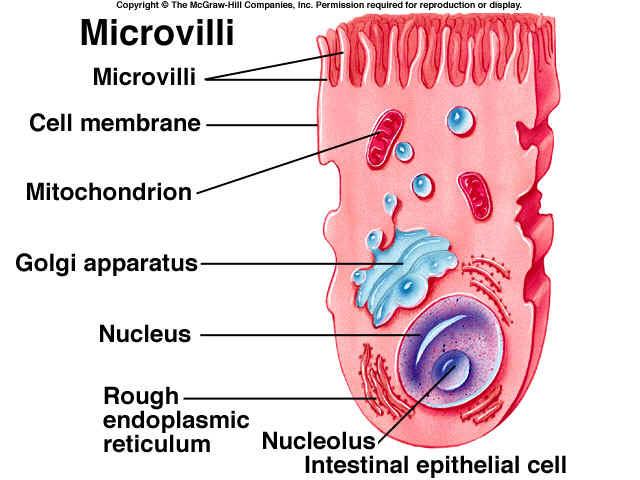
**Station 6: Epithelial (Skin) Tissue (contains skin cells)**

The epidermis (outer layer of the skin) consists of flattened skin cells arranged in layers. These cells are attached to each other tightly to form a tough, seamless layer. This layered, tightly-joined sheet of cells is ideal for epidermal skin tissue because the epidermis is exposed to constant abrasion and damage from the outside environment. The skin’s role in the body is mainly protection of internal organs.



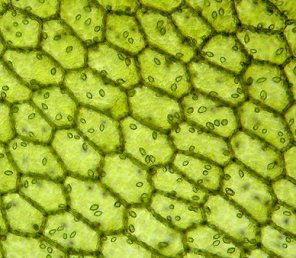
**Station #7: Small Intestine Cells**

The cells of the small intestine are used to absorb nutrients from digested food so these nutrients can be passed to the bloodstream and used throughout the body. To take in the maximum amount of nutrients, small intestine cells must have A LOT of membrane to allow transport of materials into and out of the cells. Therefore, they have a series of folds called microvilli in their cell membrane that allow them to pack a large amount of membrane into a small space.

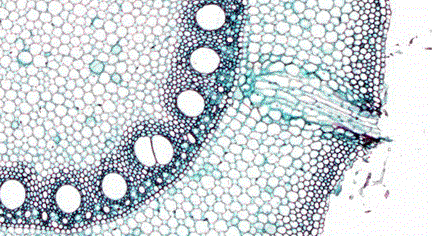
**Station #8: Plant Leaf Cells**

Leaf cells are where most photosynthesis occurs in the plant, since leaves are the part of the plant that is closest to the sun. When viewing leave cells under the microscope, you should see green pigment throughout the cells. This is chlorophyll, the molecule used to capture energy from sunlight. Most of the chlorophyll is concentrated in the darker green circles seen inside the leaf cells, which are chloroplasts. There are more chloroplasts in leaf cells than in any other plant cell type, since chloroplasts are the organelle in which photosynthesis occurs. Leaf cells—like all plant cells—appear somewhat rectangular in shape as a result of their cell walls.

**Station #9: Plant Stem Cells**

When looking through a horizontal slice of a plant stem, you will see several sets of “holes.” These holes represent tube-like cells that extend throughout the stem. There are two types of tube-like cells – xylem and phloem. Xylem cells are used to transport water from the roots of the plant to the leaves of the plant. Phloem cells are used to transport sugars made in the leaf cells during photosynthesis down throughout the rest of the plant.



**Station #10: Plant Root Cells**

The tips of plant roots are shaped like long fingers. This shape maximizes the amount of membrane on each cell within the “finger” that has contact with the soil. If more cell membranes can be used to absorb water and minerals from the soil, the plant will have the ability to take in all the water it needs for photosynthesis and other cell processes. It will also be able to take in atoms like nitrogen, phosphorus, and sulfur that are used in the macromolecules within plant cells (i.e. carbohydrates, lipids, proteins, and nucleic acids).

**Multiple Plant Roots A Single Root Tip**